**REMARKS**

This paper is submitted in response to the Notice of Non-Compliant Amendment dated mailed June 3, 2003 and includes a response rectifying the omissions and corrections identified in the Notice.

Reconsideration of the present application in view of the Office Action dated September 11, 2002 is respectfully requested.

Several of the amendments to the specification are submitted to obviate the requirement for amended drawings.

Others of the submitted amendments to the specification overcome the informalities noted by the Examiner.

The claims have been amended to overcome the rejection based upon 35 U.S.C. 112, Second Paragraph, by the deletion of the term "vicinity" in claim 1 and the term "about" in claim 13.

In response to the rejections on art, Claim 1 has been amended to more particularly point out and more distinctly claim the subject matter of the present invention. Antecedent basis for the amendments to claim 1 is derived from at least page 5, line 37 through page 6, line 11 as well as page 8, lines 19 to 24.

These amendments make explicit that in accordance with the present invention the binder material is applied to the surface of the backing prior to the formation of the pile loops. Thus, the binder is able to concentrate in the region of the root portion of the pile to hold the pile to the backing. At the same time the upper portions of the pile elements remain substantially free of binder material (see, page 6, lines 15 to 20).

None of the references relied upon by the examiner anticipate or render obvious the invention recited in the amended claims.

The two primary references, U.S. Patent 4,871,604 (Hackler) and U.S. Patent 2,261,096 (Reinhardt), both relate to methods in which a binder material is applied after the formation of the nap or pile. Moreover, the binder material is disposed over the entire pile structure.

Reinhardt relates to the formation of a needled felt product. After a layer of fiber is needled-punched into a base fabric the entire structure is immersed to a tank of dilute adhesive. The entire product is covered with the adhesive material for the purpose of improving the durability of the product.

Hackler also discloses a method in which a binder, albeit in powder form, is dispensed over the entire tufted pile surface. The purpose of the binder is to insure adhesion among the filaments along the entire length of the pile tufts.

Neither of these references anticipates nor renders obvious the claimed invention. In accordance with the present invention binder material is applied prior to the formation of the pile, and in a manner that insures that the binder is concentrated near the roots of the pile. The binder serves to bond the pile to the backing and to the stitching yarns without disposing binder along the length of the pile tufts. The major portion of the length of each tuft is thus not stiffened by the presence of binder material.

U.S. Patent 4,619,853 (Blyth et al.) appears to disclose a standard pile formation process, and is not seen to impact adversely the patentability of the present invention.

In view of the foregoing it is submitted that the claims of this application define patentably over the references cited by the examiner, and that this application stands in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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Dated: June 20, 2003

**MARKED-UP VERSION OF REWRITTEN SPECIFICATION**

In showing the changes, inserted information is shown by underlining and deletions are by a strike-through.

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At page 2, please amend the paragraph beginning at line 10 and extending through line 21 to read as follows:

--Accordingly, in view of the foregoing it is believed desirable to provide a process, which utilizes a binder material with a relatively low melting point so that the binder can be processed at ~~a~~ temperatures under the critical temperatures that adversely affect the pile material. The process should, at the same time, be practiced in a physical environment in which pressure may be brought to bear on the pile to cause the thermoplastic binder to propagate without crushing of the pile. It is believed to be of further advantage to achieve this result while the pile surface structure is subjected to usual industry finishing processes, such as scouring, dyeing and drying. --.

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At page 4, please amend the paragraph beginning at line 27 and extending through line 37 to read as follows:

--As the adjacent needles draw the threads downwardly toward the backing 14 the dispensed length of yarn becomes trained over the surface of the sinker finger, thereby forming a laid-in pile yarn element 16 overlying above the first surface 14S of the backing 14. Continued downward

movement of each needle through the backing 14 forms an underlap portion 20U of a chain stitch ~~20~~. The underlap 20U of the stitch ~~20~~ secures the pile yarn element 16 against the first surface 14S. Each stitch ~~20~~ also includes an interlockable looped overlap portion 20L that lies against the bottom surface ~~14B~~ 14L of the backing 14. Sequential overlap portions 20L typically --.

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At Page 5, please amend the text beginning at lines 1 and 2 to read as follows:

--chain-fashion, longitudinally along the bottom surface ~~14B~~ 14L of the pile surface structure 10. --.

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At page 5, please amend the paragraph beginning at line 3 and extending through line 13 to read as follows:

--In a loop pile embodiment illustrated in Figure 1 the pile element 16 has the form of an inverted loop 16L that overlies the top surface 14S of the backing between a first generally U-shaped root portion 16R-1 located in a first longitudinally extending stitch line and a second generally U-shaped root portion 16R-2 located in a second longitudinally extending stitch line. The root portions 16R-1, 16R-2 are each held against the top surface 14S of the backing 14 by the underlap portion 20U of one of the stitches ~~20~~. The underlaps 20U constrict the pile yarn to form distended regions 16D in the vicinity of each underlap 20U.--.

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At page 8, please amend the text beginning at line 1 and extending through line 8 to read as follows:

--the surface 14S, the backing 14 is heated to a temperature slightly (on the order ~~if~~ of a few degrees) greater than the melting point of the primary binder powder, thus melting the primary powder binder and attaching the same to the backing 14. After solidifying downstream of the heating device a layer of the primary powder binder (indicated by the reference character 24L in Figure 3A) is attached over the surface 14S of the backing 14.--.

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At page 8, please amend the paragraph beginning at line 19 and extending through line 31 to read as follows:

--The backing 14 with the binder material 24L, 24L' applied to the surface 14S thereof is next stitched, as indicated by the reference character 32, using a stitching apparatus such as the one described above. In the stitching apparatus the pile elements 16 are formed on the backing 14 in the manner above discussed. Accordingly, as illustrated in Figures 3A or 3B, at the reference point R at the outlet of the stitching apparatus the upper surface 14S of the backing 14 has an array of pile elements 16 formed thereover. The root portions 16R of the pile elements 16 are attached to the backing 14 by the underlaps 20U of the stitches ~~20~~. The surface 14S of the backing has a layer 24L, 24L', as the case may be, of binder disposed thereon.--

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At page 10, please amend the paragraph beginning at line 25 and extending through line 37 to read as follows:

--In another embodiment of the invention the temperature at which the flexing occurs is maintained by passing steam or a heated gas having a temperature greater than the melting point of the binder over the pile surface structure 10. An example of a suitable apparatus 54 for this purpose is illustrated in stylized diagrammatic form in Figure 5. The apparatus 54, generally similar to a standard vertical steamer apparatus, includes an enclosure ~~56~~ having entrance port 56P and exit port 56P' defined in the walls thereof. Roller elements 58 and/or fixed abutments 60 (if desired) are mounted within the enclosure ~~56~~. The rollers 58 and the abutments 60 may be any suitable configuration to effect the action to be described. For example, as suggested in Figure 5, the rollers 58 (which--.

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At page 11, please amend the paragraphs beginning at line 3 and extending through line 24 to read as follows:

--In operation, a length of pile surface structure 10 is threaded over the rollers 58 and the abutments 60. The pile surface structure 10 is drawn through the enclosure ~~56~~ by the action of a pair of nip rolls 62 disposed in a convenient location, such as adjacent to the exit port 56P'. Preferably, those rollers 58 which interface against the pile elements 16 (i.e., the lower rollers 58 in Figure 5) have pins 58P which penetrate into the upper surface 14S of the

backing 14, to avoid crushing of the pile elements 16. The other rollers engage the bottom surface ~~14B~~ 14L of the backing 14. The nip roll 62 may also be provided with pins 62P, if desired.

The pile surface structure 10 is drawn into and through the enclosure ~~56~~ by the action of the nip rolls 62, as indicated by the reference arrows 64. The pile surface structure 10 is thus conveyed, in serpentine fashion, over and under the rollers 58 and/or the abutments 60 mounted within the enclosure ~~56~~. At the same time the pile surface structure 10 within the enclosure ~~56~~ is subjected to a flow of steam or hot gas (such as hot air) introduced into the enclosure, as from suitable jets 66 provided for that purpose. The temperature of the steam or hot gas is sufficient to melt the binder material on the pile surface structure 10.--.

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At page 12, please amend the paragraph beginning at line 1 and extending through line 5 to read as follows:

--Yet further, a second pairs of nip rolls 68 (with pins 68P) may be mounted within the enclosure ~~56~~. These nip rolls 68 serve to force a length of the pile surface structure 10 into a U-shaped region defined between plates 70 and thus, further flexing the pile structure 10.--.

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At page 15, please amend the paragraph beginning at line 7 and extending through line 14 to read as follows:

--After stitching 32 (and scouring 36, if desired) a slurry similar to that described in connection with Figure 2A is applied to the bottom surface of the pile surface structure, as illustrated by the block 26. The liquid penetrates through the backing 14' to reach the vicinity of the root portion 16R of the loops 16L. The resulting pile surface structure, wherein the liquid binder permeates the structure as indicated by the waved lines ~~$24L^3$~~ $\underline{24^3}$, is illustrated in Figure 3H.--.

**MARKED-UP VERSION OF REWRITTEN CLAIMS**

In showing the changes, inserted information is shown by underlining and deletions are by a strike-through.

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1. (Currently Amended) A process for bonding an array of pile loops stitched onto a surface of a backing, each pile loop having a root portion that is held to the surface of a backing by a stitching thread, the process comprising the steps of :

prior to formation of the pile loops,

applying a thermoplastic binder material having a predetermined melting point to the backing ~~in the vicinity of the root portion of the loops~~ ;

mechanically flexing the backing with the loops thereon into and out of the plane of the backing at a temperature greater than the melting point of the binder,

thereby to cause the binder material to melt and to flow and concentrate in the root portion of the pile loops , in ~~the vicinity of~~ the stitching thread underlaps holding the root portion to the backing, and near the surface of the backing adjacent to the root portions .

13. (Currently Amended) The process of claim 2 wherein the thermoplastic binder is an amorphous binder in the form of a powder having particle sizes in the range of one (1) to five hundred (500) microns, the powder binder having a melting point in the range from ~~about~~ eighty-five (85) to ~~about~~ one hundred degrees Centigrade (100 °C).

~~14. The process of claim 13 wherein the powder binder is applied to the backing in a dry state,~~

~~wherein the process further comprises the step of:~~

~~after application of the powder binder, heating the surface of the backing to a temperature greater than the melting point of the powder binder thereby to melt the powder binder to attach it to the surface of the backing.~~

~~15. The process of claim 13 wherein the powder binder is applied to the backing in a melt-blown dry state.~~

~~17. The process of claim 13 wherein the powder binder is applied to the backing in the form of a slurry comprising the binder powder dispersed in a liquid vehicle, the liquid vehicle having a soluble adhesive dissolved therein,~~

~~the soluble adhesive having a setting point in the range from five (5) to twenty (20) degrees Centigrade °C below the melting point of the binder,~~

~~wherein the process further comprises the step of:~~

~~after application of the binder slurry, heating the surface of the backing to a temperature greater than the setting point of the soluble adhesive but below the melting point of the powder binder thereby to attach the powder binder to the surface of the backing.~~

~~18. The process of claim 17 wherein prior to mechanically flexing the backing the formed pile structure is soaked in water for at least one (1) minute.~~

~~19. The process of claim 13 wherein the thermoplastic binder powder is mixed with a secondary thermoplastic adhesive powder having particle sizes in the range of one (1) to five hundred (500) microns, the dry powder adhesive having a melting point in the range from five (5) to twenty (20) degrees Centigrade °C below the melting point of the binder.~~

~~20. The process of claim 19 wherein the mixture of powder binder and a secondary thermoplastic adhesive powder is applied to the backing in a dry state,~~

~~wherein the process further comprises the step of:~~

~~after application of the powder mixture, heating the surface of the backing to a temperature greater than the melting point of the secondary thermoplastic adhesive powder thereby to melt the a secondary thermoplastic adhesive powder to attach the powder binder to the surface of the backing.~~

~~21. The process of claim 19 wherein the mixture of powder binder and the secondary thermoplastic adhesive powder is applied to the backing in the form of a slurry comprising the binder powder and the secondary thermoplastic adhesive powder dispersed in a liquid vehicle,~~

~~wherein the process further comprises the step of:~~

~~after application of the slurry, heating the surface of the backing to a temperature greater than the melting point of the secondary thermoplastic adhesive powder thereby to melt the secondary thermoplastic adhesive powder to attach the binder powder to the surface of the backing.~~

~~22. The process of claim 2 wherein the binder is in the form of a strand of binder material that is laid into the vicinity of the root portions of the pile loops.~~

~~23. The process of claim 22 wherein the binder strand is disposed under the underlaps.~~

~~24. The process of claim 22 wherein the binder strand is disposed between the root portions of the pile elements and the backing.~~

~~25. The process of claim 22 wherein the stitching threads includes a binder material.~~

~~26. The process of claim 22 wherein the binder strand is weft-inserted between the root portions of the pile elements and the backing.~~

~~27. The process of claim 22 wherein the backing has an upper and a bottom surface thereon and an open structure adapted to permit a liquid slurry to penetrate therethrough, and wherein the binder material is applied in the form of a liquid slurry to the bottom surface of the backing.~~